DEPARTMENT OF MATERIALS SCIENCE AND TECHOLOGY
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
NWI202	2			4
Title	**T**	**A**	**L**	**ECTS**
Physical Chemistry II	3	1	1	6

Language	German					
Level	**Undergraduate**	**X**	**Graduate**		**Postgraduate**	
Department / Program	Materials Science and Technology					
Forms of Teaching and Learning	Face to face					
Course Type	**Compulsory**	**X**	**Elective**			
Objectives	Building on a deep understanding of the subject, students should be able to: • to discuss the phase behavior of real systems, processes at electrodes, and chemical equilibria based on molecular and thermodynamic concepts. • Have a basic understanding of chemical kinetics and reaction dynamics. • to master the most important experimental techniques for the measurement and evaluation of physical-chemical quantities and processes.					
Content	Theory: reactions in water; Electrochemistry; reaction kinetics; Atmospheric chemistry. Practical course: Melting diagram of binary mixtures, pH-dependence of a solvolysis reaction, birefringence of light by nematic liquids, viscosity of liquids, heat of evaporation, cane sugar inversion, viscosity of gases, decomposition of diacetone alcohol, charge transport in electrolyte solutions, pH balance of buffer ¬lösungen, Nernst distribution set, mixing behavior of liquids, quantum mechanics					
Prerequisites						
Coordinator						
Lecturer(s)	Asist Prof.Dr. Sibel Özenler					
Assistant(s)						
Work Placement	No					

Recommended or Required Reading	
Books / Lecture Notes	G. Wedler: Lehrbuch der Physikalischen Chemie; VCH, 5. Aufl., 2004
Other Sources	G. Wedler: Lehrbuch der Physikalischen Chemie; VCH, 5. Aufl., 2004 Yardımcı Kaynaklar: 1. P.W. Atkins: Physikalische Chemie; VCH-Wiley, 4. Aufl., 2006 2. T Engel/P. Reid; Physikalische Chemie

Additional Course Material	
Documents	
Assignments	
Exams	

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Course Composition		
Mathematics und Basic Sciences		60%
Engineering		40%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge		%

Assessment		
Activity	**Count**	**Percentage (%)**
Midterm Exam	1	20
Quiz		
Assignments		
Attendance		
Recitations	1	30
Projects	1	10
Final Exam	1	40
Total	**4**	**100**

ECTS Points and Work Load			
Activity	**Count**	**Duration**	**Work Load (Hours)**
Lectures	15	2	30
Self-Study	15	5	75
Assignments	2	6	12
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	15	1	15
Laboratory	15	2	30
Projects			
Final Exam	1	2	2
		Total Work Load	**166**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes	
1	Building on a deep understanding of the subject, students should be able to discuss the phase behavior of real systems, processes at electrodes, and chemical equilibria based on molecular and thermodynamic concepts.
2	

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3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Weekly Content	
1	Foundations of reaction kinetics
2	Basics, complex kinetics and approximation, activation energy and catalysis
3	Basics, complex kinetics and approximation, activation energy and catalysis
4	Basics, complex kinetics and approximation, activation energy and catalysis
5	postulates of quantum mechanics, Schrödinger equation, simple quantum chemical models
6	postulates of quantum mechanics, Schrödinger equation, simple quantum chemical models
7	postulates of quantum mechanics, Schrödinger equation, simple quantum chemical models
8	postulates of quantum mechanics, Schrödinger equation, simple quantum chemical models
9	quantum-mechanical approximation, atomic structure
10	quantum-mechanical approximation, atomic structure
11	quantum-mechanical approximation, atomic structure
12	quantum-mechanical approximation, atomic structure
13	chemical bond, electromagnetic spectrum
14	chemical bond, electromagnetic spectrum
15	chemical bond, electromagnetic spectrum

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
All	3	1					
1							
2							
3							
4							
5							

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Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High
Compiled by:	
Date of Compilation:	